FIG.1

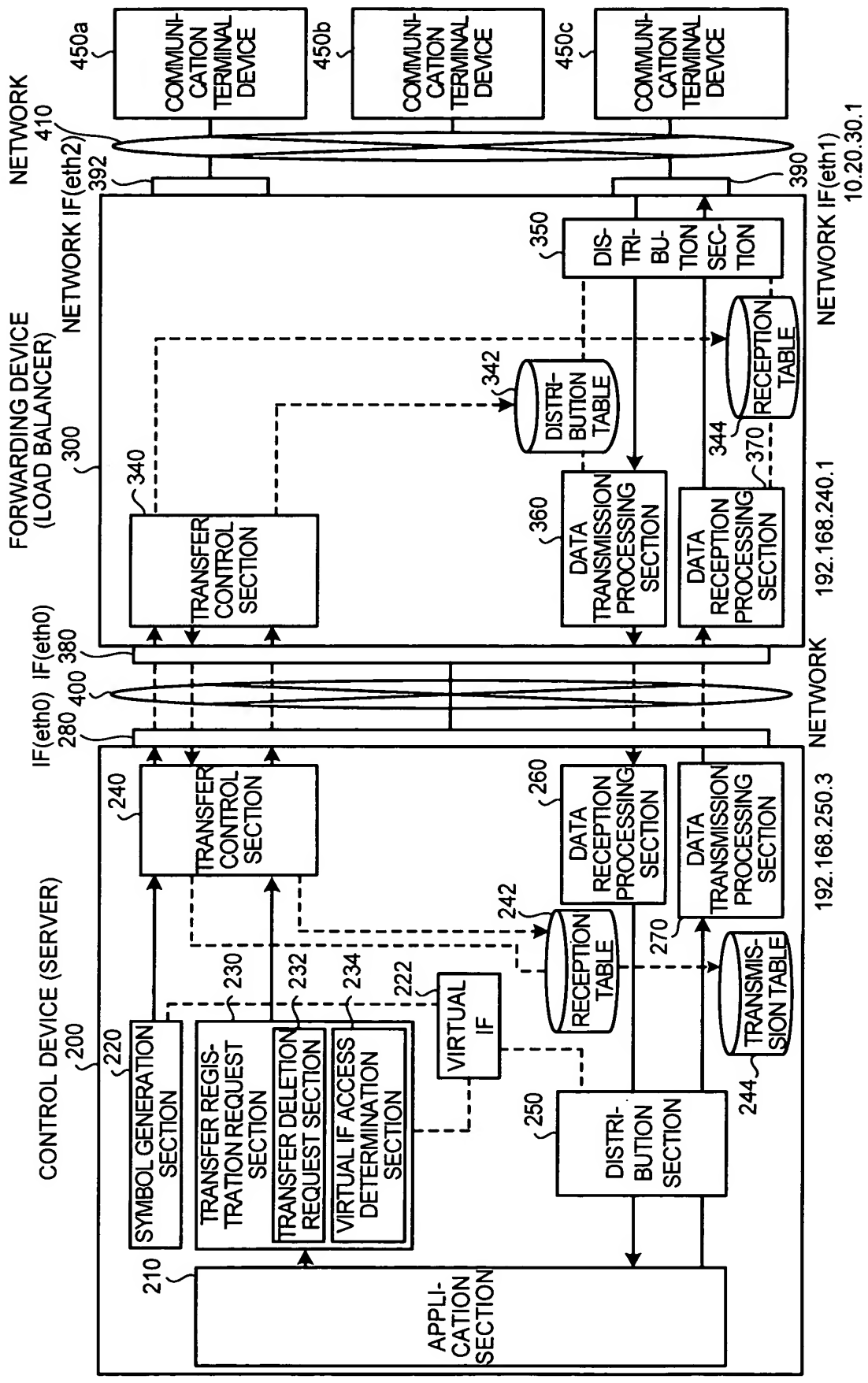

450a
COMMUNICATION TERMINAL DEVICE
450b
COMMUNICATION TERMINAL DEVICE
450c
COMMUNICATION TERMINAL DEVICE
NETWORK 410
NETWORK IF(eth2) 392
NETWORK IF(eth1) 390
10.20.30.1
FORWARDING DEVICE (LOAD BALANCER) 300
350 DISTRIBUTION SECTION
342 DISTRIBUTION TABLE
344 RECEPTION TABLE
340 TRANSFER CONTROL SECTION
360 DATA TRANSMISSION PROCESSING SECTION
370 DATA RECEPTION PROCESSING SECTION
192.168.240.1
IF(eth0) 380
400 NETWORK
IF(eth0) 280
CONTROL DEVICE (SERVER) 200
240 TRANSFER CONTROL SECTION
260 DATA RECEPTION PROCESSING SECTION
270 DATA TRANSMISSION PROCESSING SECTION
242 RECEPTION TABLE
TRANSMISSION TABLE 244
192.168.250.3
220 SYMBOL GENERATION SECTION
230 TRANSFER REGISTRATION REQUEST SECTION
232 TRANSFER DELETION REQUEST SECTION
234 VIRTUAL IF ACCESS DETERMINATION SECTION
222 VIRTUAL IF
250 DISTRIBUTION SECTION
210 APPLICATION SECTION

FIG.2

CONTROL DEVICE ADDRESS	192.168.250.3
VIRTUAL IF	veth1
ACTUAL IF	eth1

FIG.3

REPEATER ADDRESS	192.168.240.1
VIRTUAL IF	veth1
ACTUAL IF	eth1
DOWN TUNNEL ID	250

FIG.4

CONTROL DEVICE ADDRESS	192.168.250.3
PROTOCOL ADDRESS	80
VIRTUAL IF	veth1
UP TUNNEL ID	150

FIG.5

UP TUNNEL ID	RECEPTION VIRTUAL IF
150	veth1

FIG.6

TRANSMISSION VIRTUAL IF	DOWN TUNNEL ID	FORWARDING DEVICE ADDRESS
veth1	250	192.168.240.1

FIG.7

RECEPTION IF	PORT NUMBER OF DESTINATION TCP/UDP	UP TUNNEL ID	DESTINATION CONTROL DEVICE ADDRESS
eth1	80	150	192.168.250.3

FIG.8

DOWN TUNNEL ID	TRANSMISSION IF
250	eth1

FIG.9

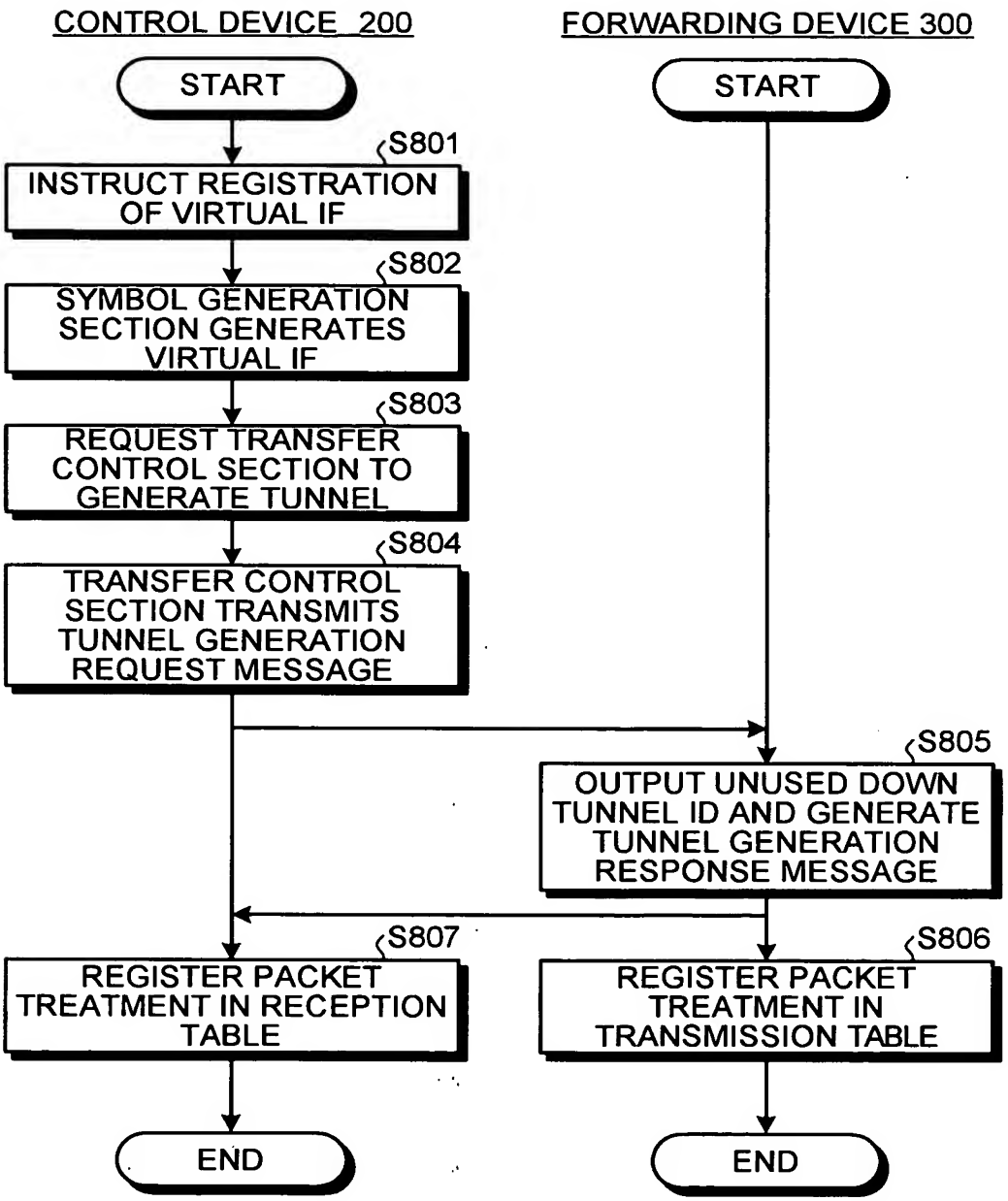

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S801
INSTRUCT REGISTRATION OF VIRTUAL IF
S802
SYMBOL GENERATION SECTION GENERATES VIRTUAL IF
S803
REQUEST TRANSFER CONTROL SECTION TO GENERATE TUNNEL
S804
TRANSFER CONTROL SECTION TRANSMITS TUNNEL GENERATION REQUEST MESSAGE
S805
OUTPUT UNUSED DOWN TUNNEL ID AND GENERATE TUNNEL GENERATION RESPONSE MESSAGE
S807
REGISTER PACKET TREATMENT IN RECEPTION TABLE
S806
REGISTER PACKET TREATMENT IN TRANSMISSION TABLE
END
END

FIG.10

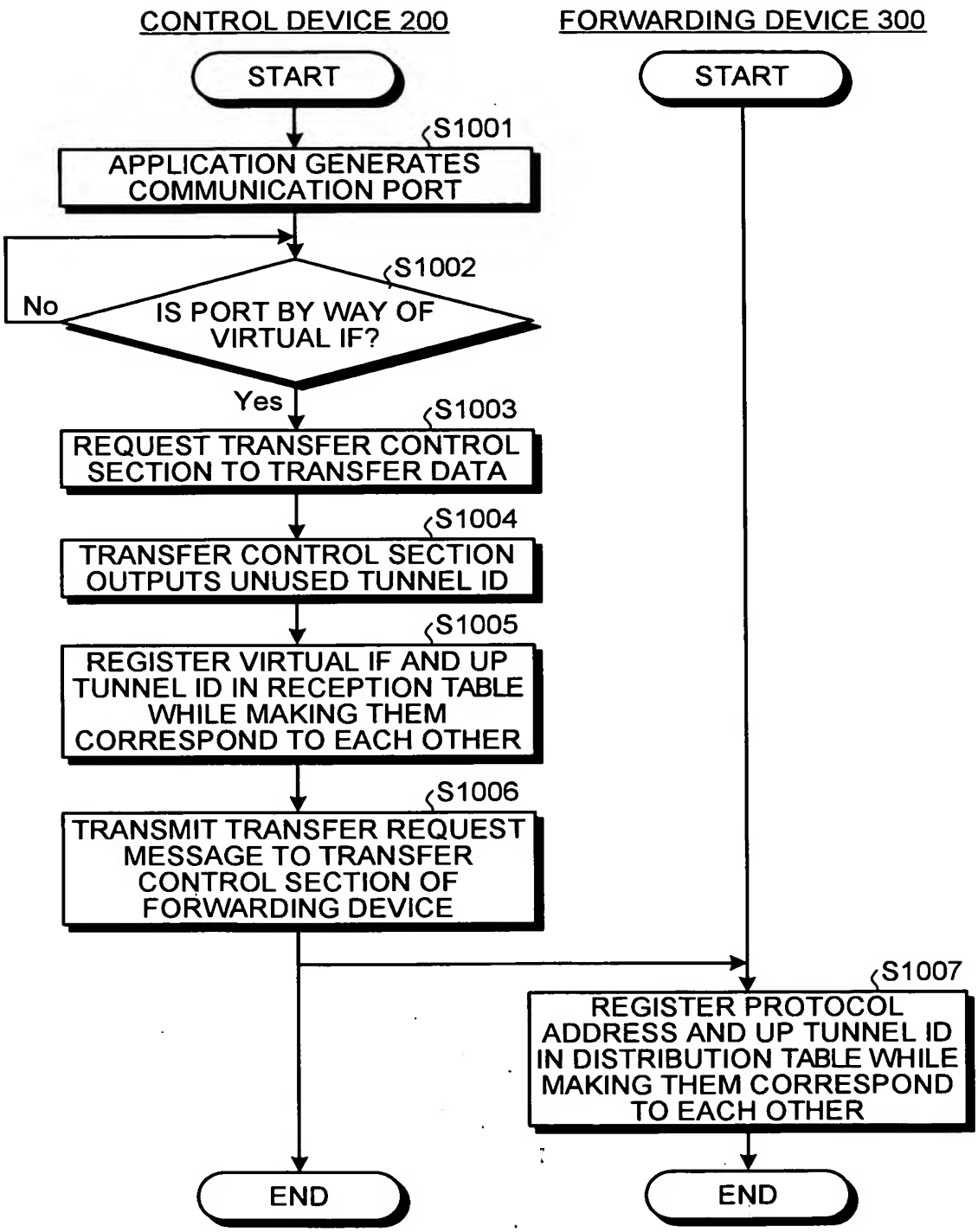

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S1001
APPLICATION GENERATES COMMUNICATION PORT
S1002
No
IS PORT BY WAY OF VIRTUAL IF?
Yes
S1003
REQUEST TRANSFER CONTROL SECTION TO TRANSFER DATA
S1004
TRANSFER CONTROL SECTION OUTPUTS UNUSED TUNNEL ID
S1005
REGISTER VIRTUAL IF AND UP TUNNEL ID IN RECEPTION TABLE WHILE MAKING THEM CORRESPOND TO EACH OTHER
S1006
TRANSMIT TRANSFER REQUEST MESSAGE TO TRANSFER CONTROL SECTION OF FORWARDING DEVICE
S1007
REGISTER PROTOCOL ADDRESS AND UP TUNNEL ID IN DISTRIBUTION TABLE WHILE MAKING THEM CORRESPOND TO EACH OTHER
END
END

FIG11

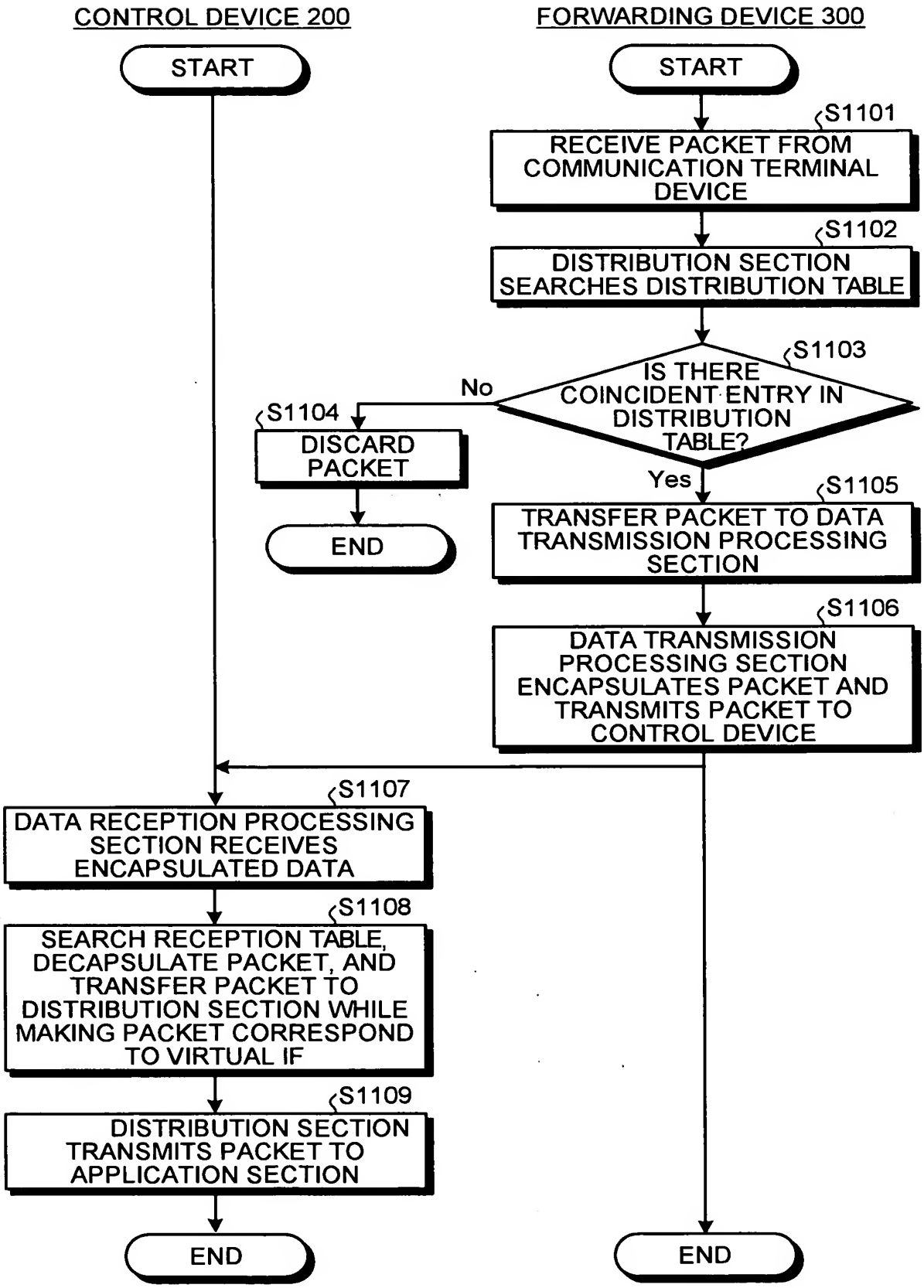

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S1101
RECEIVE PACKET FROM COMMUNICATION TERMINAL DEVICE
S1102
DISTRIBUTION SECTION SEARCHES DISTRIBUTION TABLE
S1103
IS THERE COINCIDENT ENTRY IN DISTRIBUTION TABLE?
No
Yes
S1104
DISCARD PACKET
END
S1105
TRANSFER PACKET TO DATA TRANSMISSION PROCESSING SECTION
S1106
DATA TRANSMISSION PROCESSING SECTION ENCAPSULATES PACKET AND TRANSMITS PACKET TO CONTROL DEVICE
S1107
DATA RECEPTION PROCESSING SECTION RECEIVES ENCAPSULATED DATA
S1108
SEARCH RECEPTION TABLE, DECAPSULATE PACKET, AND TRANSFER PACKET TO DISTRIBUTION SECTION WHILE MAKING PACKET CORRESPOND TO VIRTUAL IF
S1109
DISTRIBUTION SECTION TRANSMITS PACKET TO APPLICATION SECTION
END
END

FIG.12

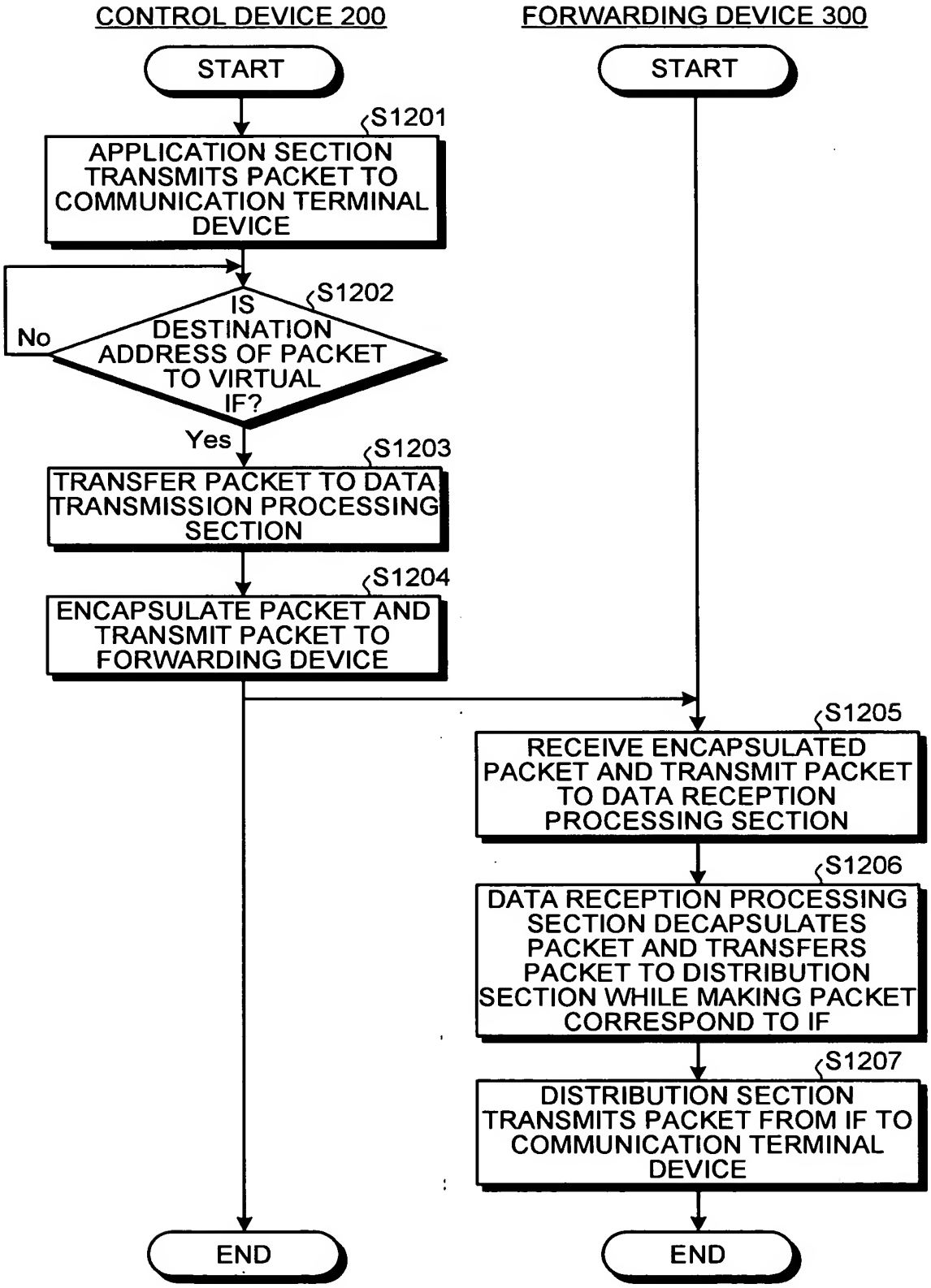

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S1201
APPLICATION SECTION TRANSMITS PACKET TO COMMUNICATION TERMINAL DEVICE
S1202
IS DESTINATION ADDRESS OF PACKET TO VIRTUAL IF?
No
Yes
S1203
TRANSFER PACKET TO DATA TRANSMISSION PROCESSING SECTION
S1204
ENCAPSULATE PACKET AND TRANSMIT PACKET TO FORWARDING DEVICE
S1205
RECEIVE ENCAPSULATED PACKET AND TRANSMIT PACKET TO DATA RECEPTION PROCESSING SECTION
S1206
DATA RECEPTION PROCESSING SECTION DECAPSULATES PACKET AND TRANSFERS PACKET TO DISTRIBUTION SECTION WHILE MAKING PACKET CORRESPOND TO IF
S1207
DISTRIBUTION SECTION TRANSMITS PACKET FROM IF TO COMMUNICATION TERMINAL DEVICE
END
END

FIG.13

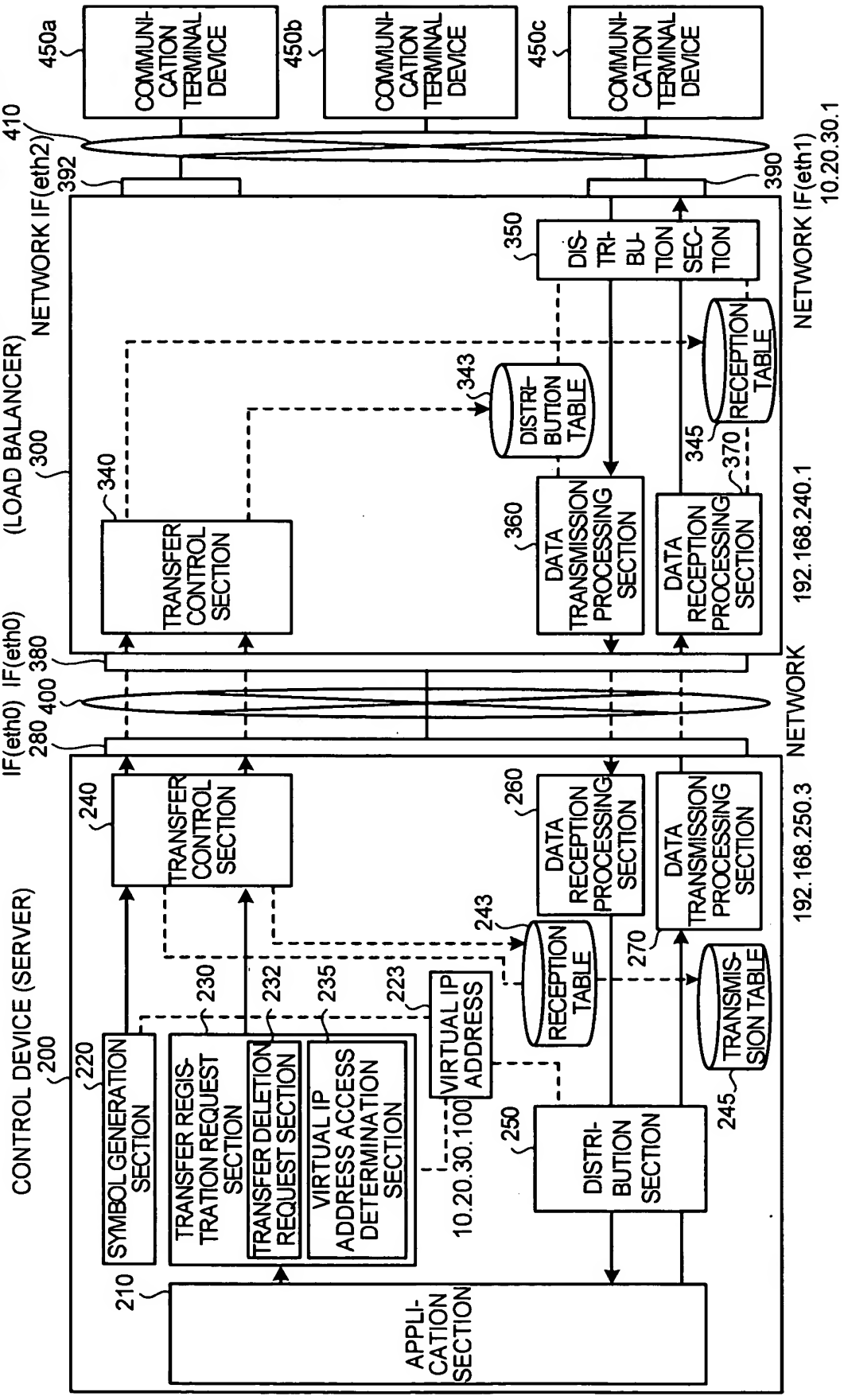

450a
COMMUNICATION TERMINAL DEVICE
450b
COMMUNICATION TERMINAL DEVICE
450c
COMMUNICATION TERMINAL DEVICE
NETWORK
410
NETWORK IF(eth2)
392
NETWORK IF(eth1)
390
10.20.30.1
FORWARDING DEVICE
(LOAD BALANCER)
300
350
DISTRIBUTION SECTION
343
DISTRIBUTION TABLE
340
TRANSFER CONTROL SECTION
360
DATA TRANSMISSION PROCESSING SECTION
345
370
DATA RECEPTION PROCESSING SECTION
RECEPTION TABLE
IF(eth0)
380
IF(eth0)
400
280
NETWORK
192.168.240.1
CONTROL DEVICE (SERVER)
200
240
TRANSFER CONTROL SECTION
260
DATA RECEPTION PROCESSING SECTION
DATA TRANSMISSION PROCESSING SECTION
243
RECEPTION TABLE
270
TRANSMISSION TABLE
220
SYMBOL GENERATION SECTION
230
TRANSFER REGISTRATION REQUEST SECTION
232
TRANSFER DELETION REQUEST SECTION
235
VIRTUAL IP ADDRESS ACCESS DETERMINATION SECTION
223
VIRTUAL IP ADDRESS
10.20.30.100
250
DISTRIBUTION SECTION
245
210
APPLICATION SECTION
192.168.250.3

FIG.14

DESTINATION IP ADDRESS	PORT NUMBER OF DESTINATION TCP/ UDP	VIRTUAL IP ADDRESS
192.168.250.3	80	10.20.30.100

FIG.15

VIRTUAL IP ADDRESS	SENDER IP ADDRESS
10.20.30.100	192.168.250.3

FIG.16

PORT NUMBER OF DESTINATION TCP/UDP	TRANSFER DESTINATION CONTROL DEVICE ADDRESS
80	192.168.250.3

FIG.17

SENDER IP ADDRESS	VIRTUAL IP ADDRESS
192.168.250.3	10.25.30.100

FIG.18

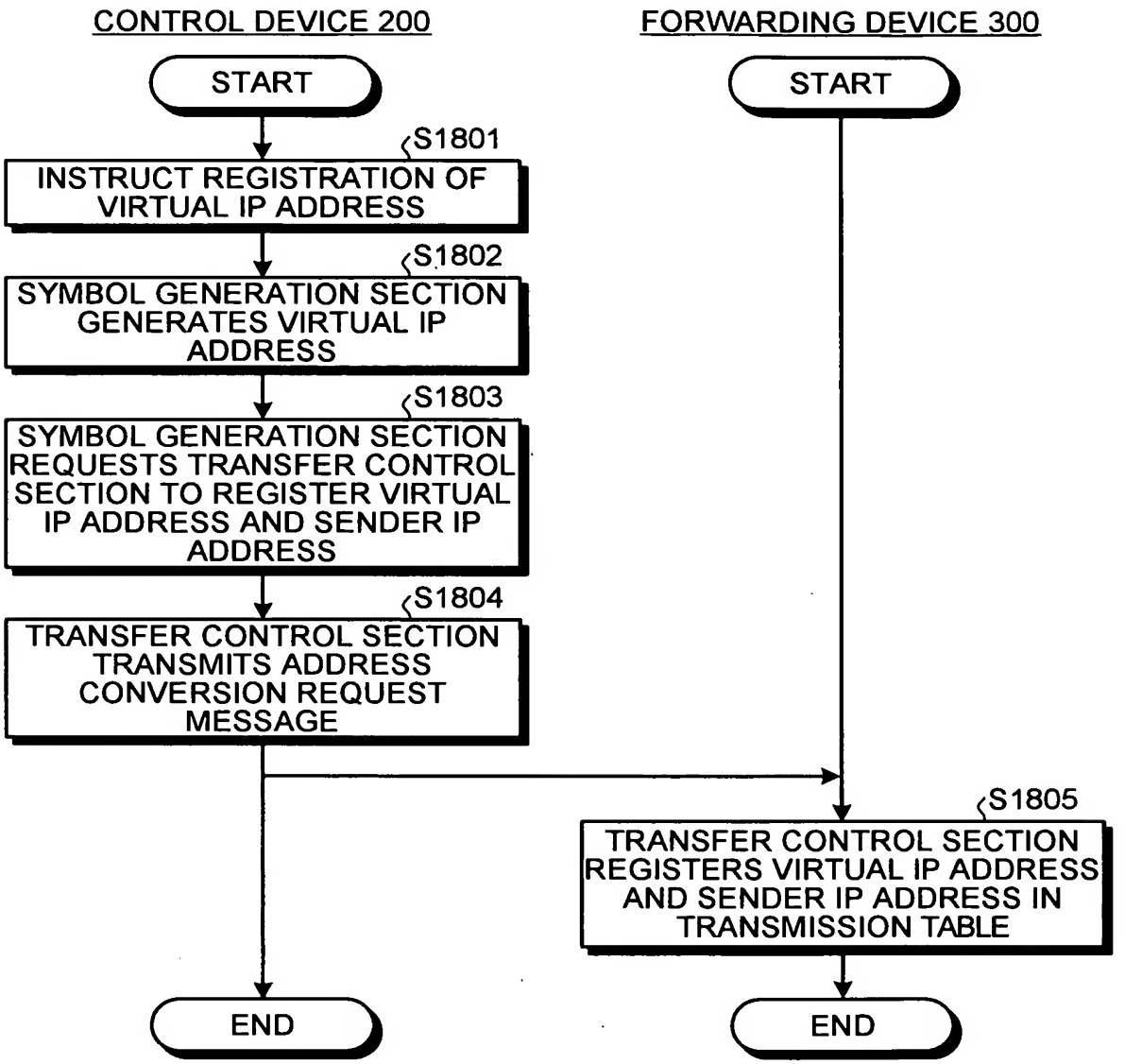


FIG.19

CONTROL DEVICE ADDRESS	192.168.250.3
VIRTUAL IP ADDRESS	10.25.30.100
SENDER IP ADDRESS	192.168.250.3

FIG.20

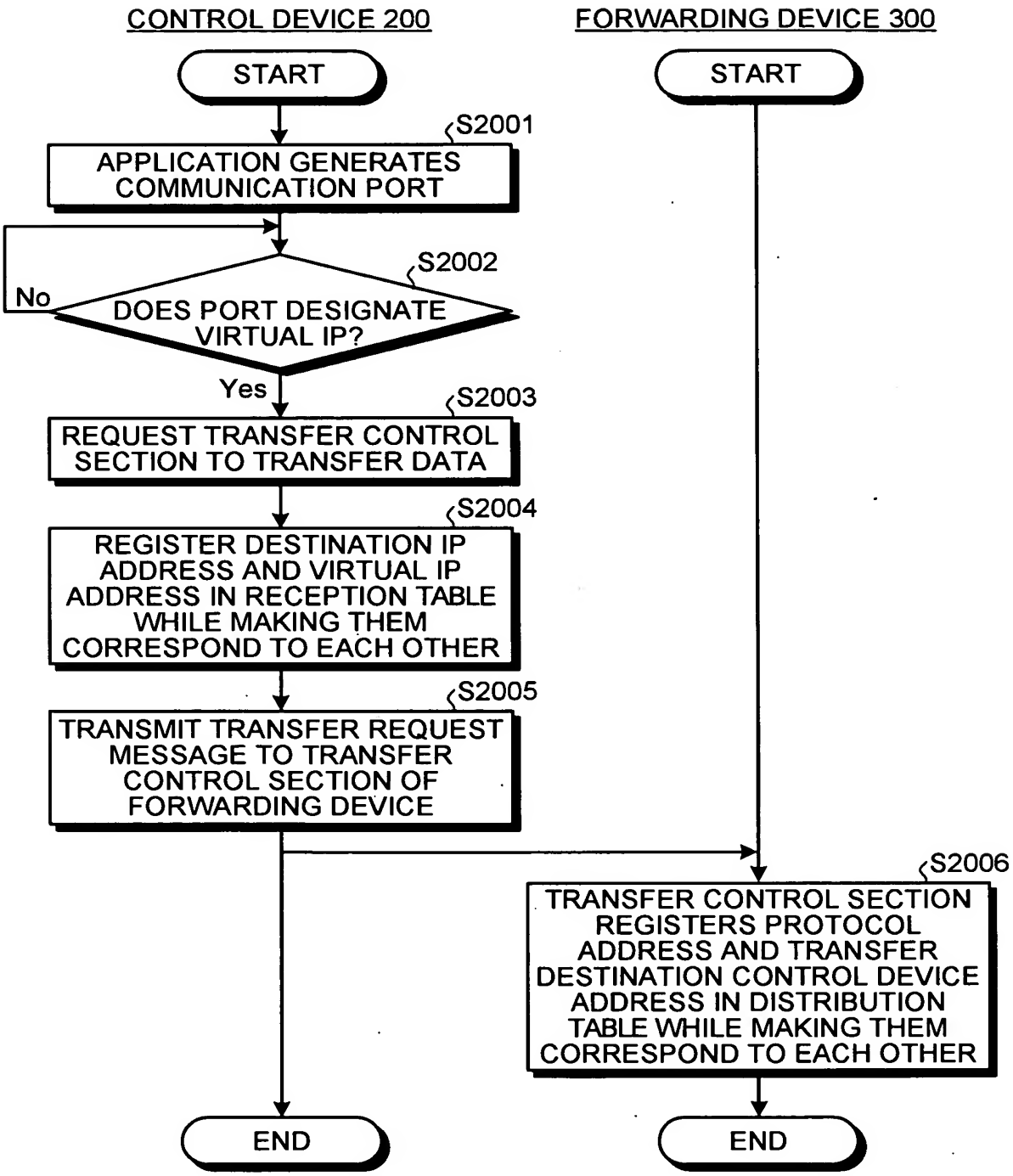

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S2001
APPLICATION GENERATES COMMUNICATION PORT
S2002
No
DOES PORT DESIGNATE VIRTUAL IP?
Yes
S2003
REQUEST TRANSFER CONTROL SECTION TO TRANSFER DATA
S2004
REGISTER DESTINATION IP ADDRESS AND VIRTUAL IP ADDRESS IN RECEPTION TABLE WHILE MAKING THEM CORRESPOND TO EACH OTHER
S2005
TRANSMIT TRANSFER REQUEST MESSAGE TO TRANSFER CONTROL SECTION OF FORWARDING DEVICE
S2006
TRANSFER CONTROL SECTION REGISTERS PROTOCOL ADDRESS AND TRANSFER DESTINATION CONTROL DEVICE ADDRESS IN DISTRIBUTION TABLE WHILE MAKING THEM CORRESPOND TO EACH OTHER
END
END

FIG.21

CONTROL DEVICE ADDRESS	192.168.250.3
PORT NUMBER OF DESTINATION TCP/UDP	80
VIRTUAL IP ADDRESS	10.25.30.100
RECEPTION IP ADDRESS	192.168.250.3

FIG.22

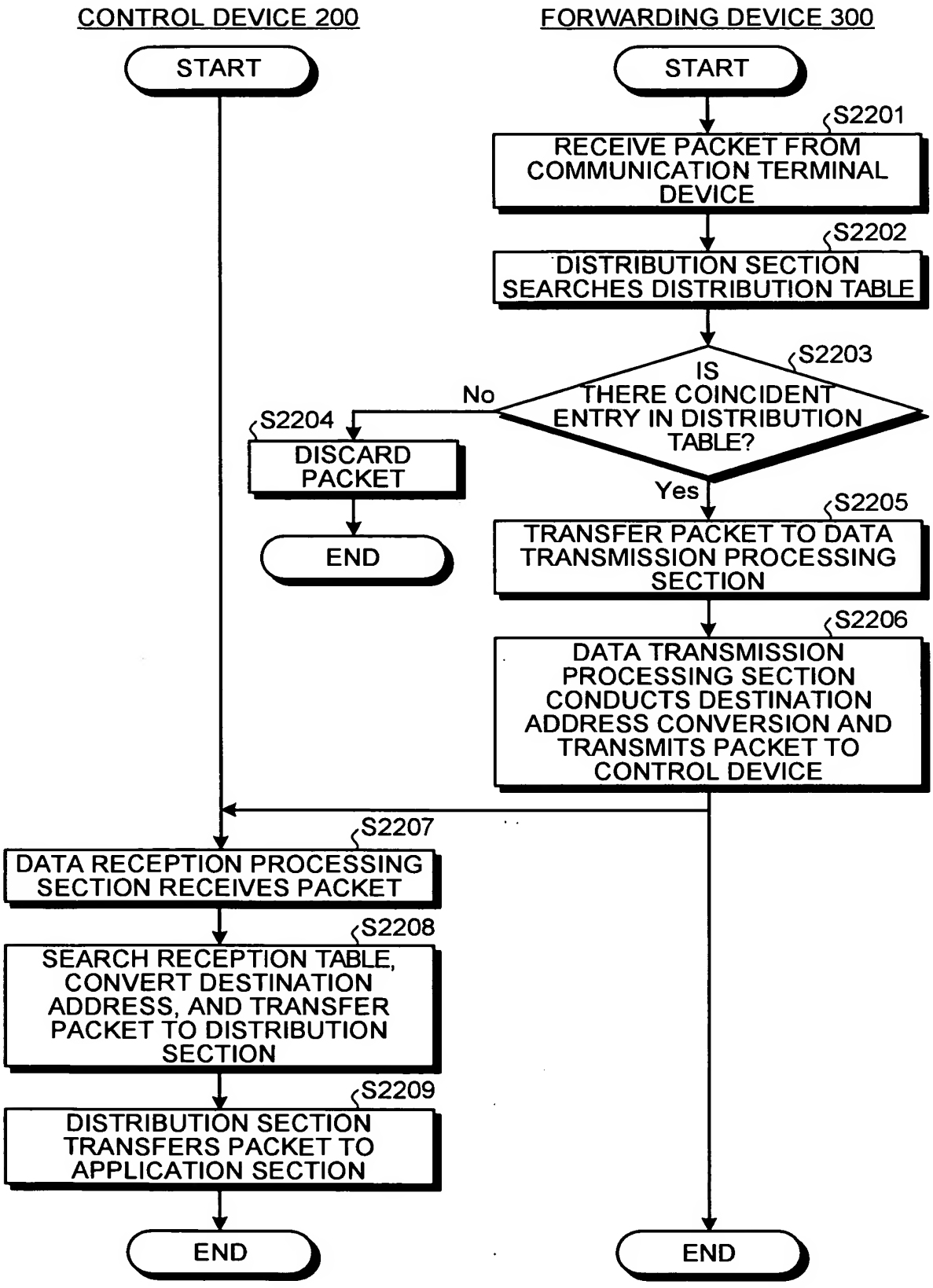

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S2201
RECEIVE PACKET FROM COMMUNICATION TERMINAL DEVICE
S2202
DISTRIBUTION SECTION SEARCHES DISTRIBUTION TABLE
S2203
IS THERE COINCIDENT ENTRY IN DISTRIBUTION TABLE?
No
S2204
DISCARD PACKET
END
Yes
S2205
TRANSFER PACKET TO DATA TRANSMISSION PROCESSING SECTION
S2206
DATA TRANSMISSION PROCESSING SECTION CONDUCTS DESTINATION ADDRESS CONVERSION AND TRANSMITS PACKET TO CONTROL DEVICE
S2207
DATA RECEPTION PROCESSING SECTION RECEIVES PACKET
S2208
SEARCH RECEPTION TABLE, CONVERT DESTINATION ADDRESS, AND TRANSFER PACKET TO DISTRIBUTION SECTION
S2209
DISTRIBUTION SECTION TRANSFERS PACKET TO APPLICATION SECTION
END
END

FIG.23

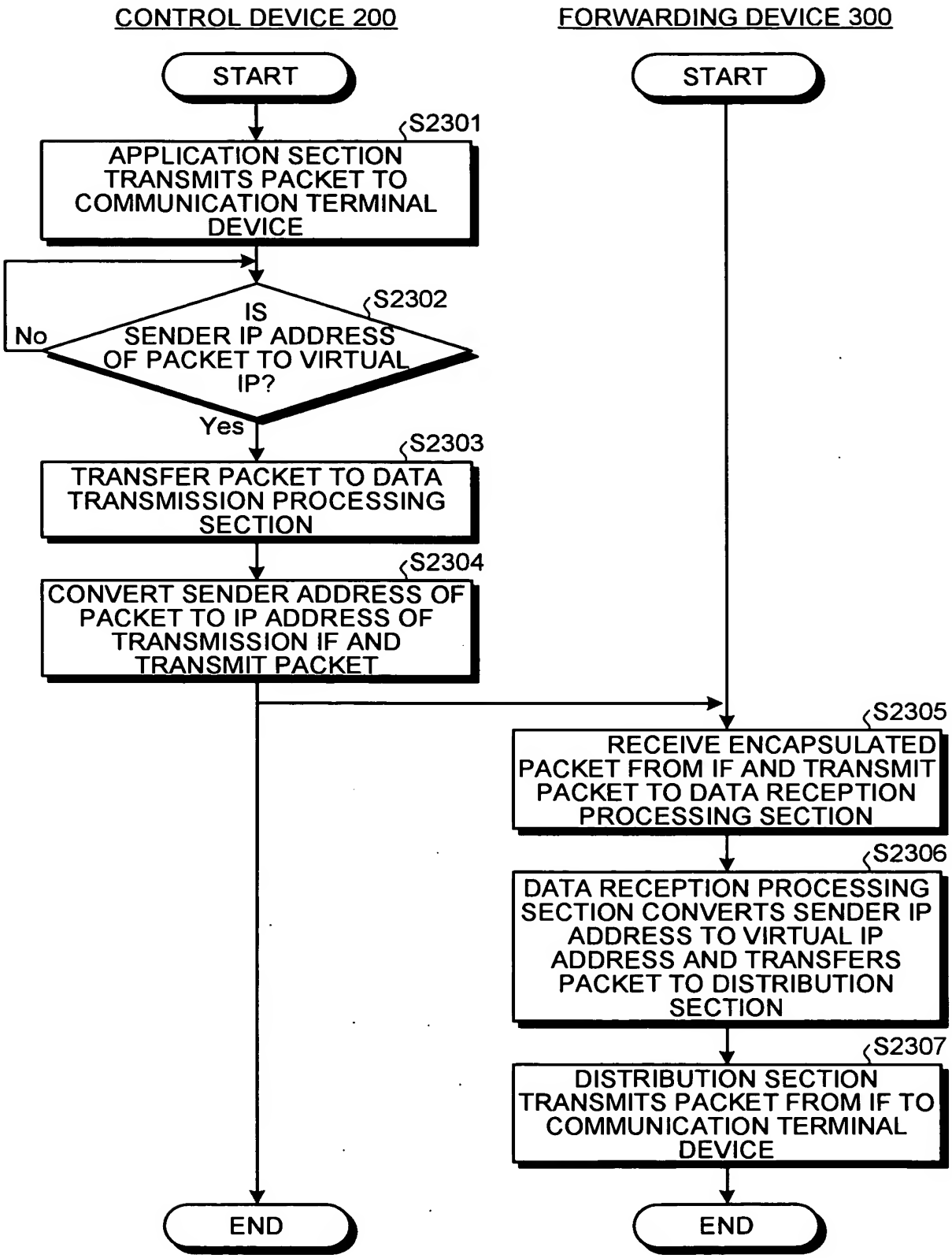

CONTROL DEVICE 200
FORWARDING DEVICE 300
START
START
S2301
APPLICATION SECTION TRANSMITS PACKET TO COMMUNICATION TERMINAL DEVICE
S2302
IS SENDER IP ADDRESS OF PACKET TO VIRTUAL IP?
No
Yes
S2303
TRANSFER PACKET TO DATA TRANSMISSION PROCESSING SECTION
S2304
CONVERT SENDER ADDRESS OF PACKET TO IP ADDRESS OF TRANSMISSION IF AND TRANSMIT PACKET
S2305
RECEIVE ENCAPSULATED PACKET FROM IF AND TRANSMIT PACKET TO DATA RECEPTION PROCESSING SECTION
S2306
DATA RECEPTION PROCESSING SECTION CONVERTS SENDER IP ADDRESS TO VIRTUAL IP ADDRESS AND TRANSFERS PACKET TO DISTRIBUTION SECTION
S2307
DISTRIBUTION SECTION TRANSMITS PACKET FROM IF TO COMMUNICATION TERMINAL DEVICE
END
END

FIG.24

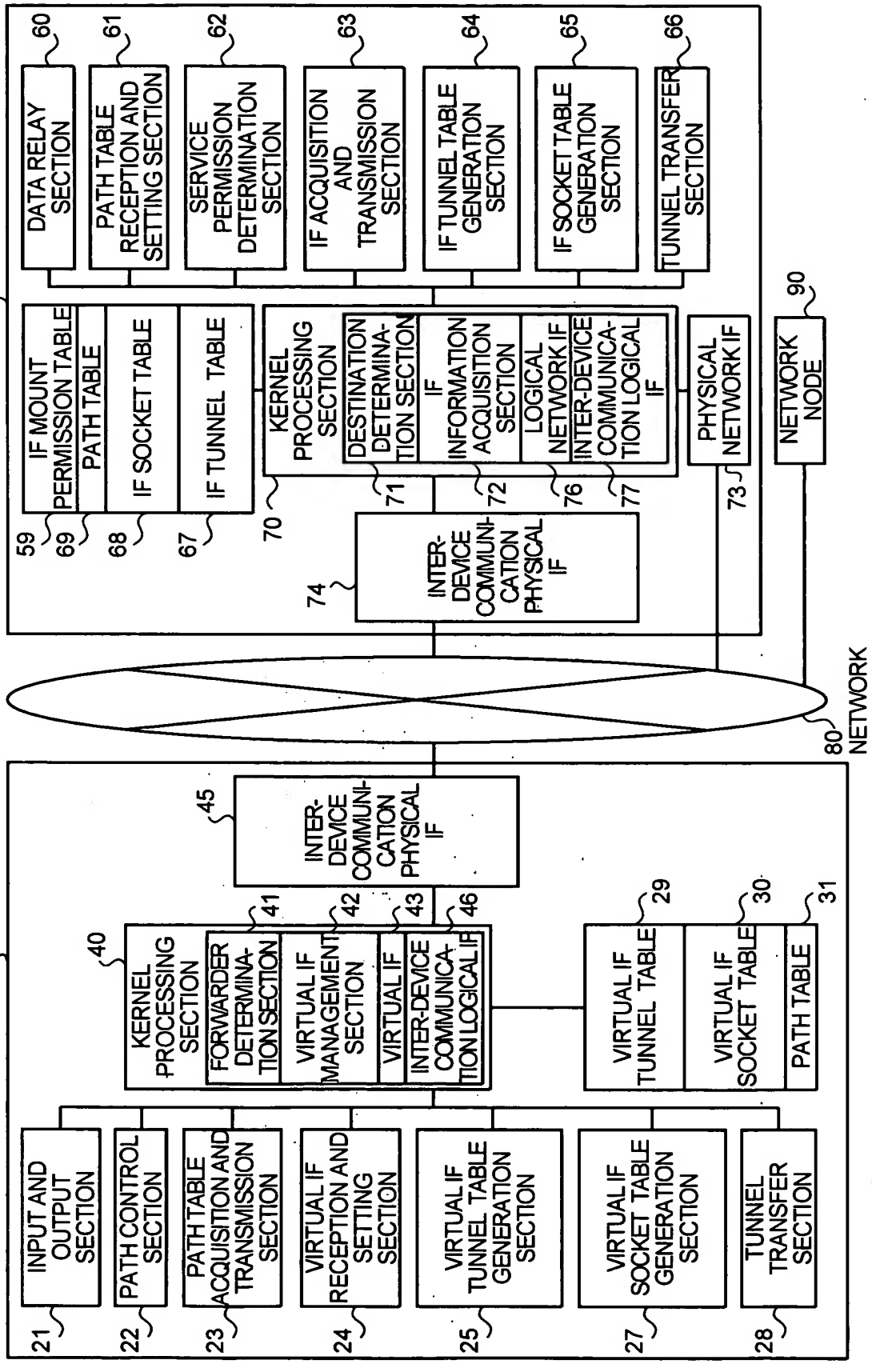

10 CONTROL DEVICE
50 FORWARDING DEVICE
80 NETWORK
INPUT AND OUTPUT SECTION
PATH CONTROL SECTION
PATH TABLE ACQUISITION AND TRANSMISSION SECTION
VIRTUAL IF RECEPTION AND SETTING SECTION
VIRTUAL IF TUNNEL TABLE GENERATION SECTION
VIRTUAL IF SOCKET TABLE GENERATION SECTION
TUNNEL TRANSFER SECTION
KERNEL PROCESSING SECTION
FORWARDER DETERMINATION SECTION
VIRTUAL IF MANAGEMENT SECTION
VIRTUAL IF
INTER-DEVICE COMMUNICATION LOGICAL IF
INTER-DEVICE COMMUNICATION PHYSICAL IF
VIRTUAL IF TUNNEL TABLE
VIRTUAL IF SOCKET TABLE
PATH TABLE
DATA RELAY SECTION
PATH TABLE RECEPTION AND SETTING SECTION
SERVICE PERMISSION DETERMINATION SECTION
IF ACQUISITION AND TRANSMISSION SECTION
IF TUNNEL TABLE GENERATION SECTION
IF SOCKET TABLE GENERATION SECTION
TUNNEL TRANSFER SECTION
IF MOUNT PERMISSION TABLE
PATH TABLE
IF SOCKET TABLE
IF TUNNEL TABLE
KERNEL PROCESSING SECTION
DESTINATION DETERMINATION SECTION
IF INFORMATION ACQUISITION SECTION
LOGICAL NETWORK IF
INTER-DEVICE COMMUNICATION LOGICAL IF
INTER-DEVICE COMMUNICATION PHYSICAL IF
PHYSICAL NETWORK IF
NETWORK NODE

FIG.25

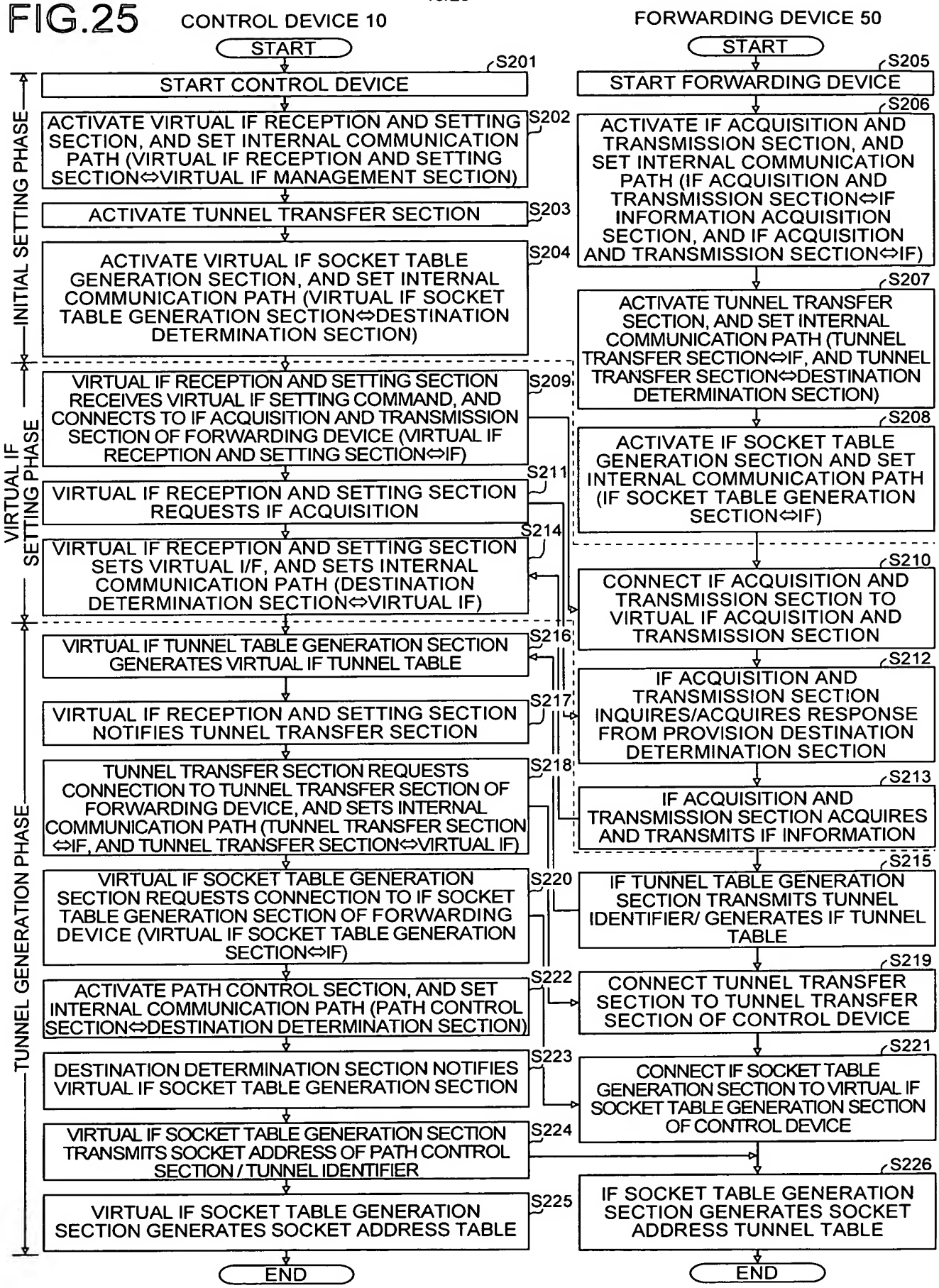

CONTROL DEVICE 10
FORWARDING DEVICE 50
START
START
INITIAL SETTING PHASE
VIRTUAL IF SETTING PHASE
TUNNEL GENERATION PHASE
S201
START CONTROL DEVICE
S205
START FORWARDING DEVICE
S202
ACTIVATE VIRTUAL IF RECEPTION AND SETTING SECTION, AND SET INTERNAL COMMUNICATION PATH (VIRTUAL IF RECEPTION AND SETTING SECTION⇔VIRTUAL IF MANAGEMENT SECTION)
S206
ACTIVATE IF ACQUISITION AND TRANSMISSION SECTION, AND SET INTERNAL COMMUNICATION PATH (IF ACQUISITION AND TRANSMISSION SECTION⇔IF INFORMATION ACQUISITION SECTION, AND IF ACQUISITION AND TRANSMISSION SECTION⇔IF)
S203
ACTIVATE TUNNEL TRANSFER SECTION
S204
ACTIVATE VIRTUAL IF SOCKET TABLE GENERATION SECTION, AND SET INTERNAL COMMUNICATION PATH (VIRTUAL IF SOCKET TABLE GENERATION SECTION⇔DESTINATION DETERMINATION SECTION)
S207
ACTIVATE TUNNEL TRANSFER SECTION, AND SET INTERNAL COMMUNICATION PATH (TUNNEL TRANSFER SECTION⇔IF, AND TUNNEL TRANSFER SECTION⇔DESTINATION DETERMINATION SECTION)
S209
VIRTUAL IF RECEPTION AND SETTING SECTION RECEIVES VIRTUAL IF SETTING COMMAND, AND CONNECTS TO IF ACQUISITION AND TRANSMISSION SECTION OF FORWARDING DEVICE (VIRTUAL IF RECEPTION AND SETTING SECTION⇔IF)
S208
ACTIVATE IF SOCKET TABLE GENERATION SECTION AND SET INTERNAL COMMUNICATION PATH (IF SOCKET TABLE GENERATION SECTION⇔IF)
S211
VIRTUAL IF RECEPTION AND SETTING SECTION REQUESTS IF ACQUISITION
S214
VIRTUAL IF RECEPTION AND SETTING SECTION SETS VIRTUAL I/F, AND SETS INTERNAL COMMUNICATION PATH (DESTINATION DETERMINATION SECTION⇔VIRTUAL IF)
S210
CONNECT IF ACQUISITION AND TRANSMISSION SECTION TO VIRTUAL IF ACQUISITION AND TRANSMISSION SECTION
S216
VIRTUAL IF TUNNEL TABLE GENERATION SECTION GENERATES VIRTUAL IF TUNNEL TABLE
S212
IF ACQUISITION AND TRANSMISSION SECTION INQUIRES/ACQUIRES RESPONSE FROM PROVISION DESTINATION DETERMINATION SECTION
S217
VIRTUAL IF RECEPTION AND SETTING SECTION NOTIFIES TUNNEL TRANSFER SECTION
S218
TUNNEL TRANSFER SECTION REQUESTS CONNECTION TO TUNNEL TRANSFER SECTION OF FORWARDING DEVICE, AND SETS INTERNAL COMMUNICATION PATH (TUNNEL TRANSFER SECTION ⇔IF, AND TUNNEL TRANSFER SECTION⇔VIRTUAL IF)
S213
IF ACQUISITION AND TRANSMISSION SECTION ACQUIRES AND TRANSMITS IF INFORMATION
S220
VIRTUAL IF SOCKET TABLE GENERATION SECTION REQUESTS CONNECTION TO IF SOCKET TABLE GENERATION SECTION OF FORWARDING DEVICE (VIRTUAL IF SOCKET TABLE GENERATION SECTION⇔IF)
S215
IF TUNNEL TABLE GENERATION SECTION TRANSMITS TUNNEL IDENTIFIER/ GENERATES IF TUNNEL TABLE
S222
ACTIVATE PATH CONTROL SECTION, AND SET INTERNAL COMMUNICATION PATH (PATH CONTROL SECTION⇔DESTINATION DETERMINATION SECTION)
S219
CONNECT TUNNEL TRANSFER SECTION TO TUNNEL TRANSFER SECTION OF CONTROL DEVICE
S223
DESTINATION DETERMINATION SECTION NOTIFIES VIRTUAL IF SOCKET TABLE GENERATION SECTION
S221
CONNECT IF SOCKET TABLE GENERATION SECTION TO VIRTUAL IF SOCKET TABLE GENERATION SECTION OF CONTROL DEVICE
S224
VIRTUAL IF SOCKET TABLE GENERATION SECTION TRANSMITS SOCKET ADDRESS OF PATH CONTROL SECTION / TUNNEL IDENTIFIER
S226
IF SOCKET TABLE GENERATION SECTION GENERATES SOCKET ADDRESS TUNNEL TABLE
S225
VIRTUAL IF SOCKET TABLE GENERATION SECTION GENERATES SOCKET ADDRESS TABLE
END
END

FIG.26

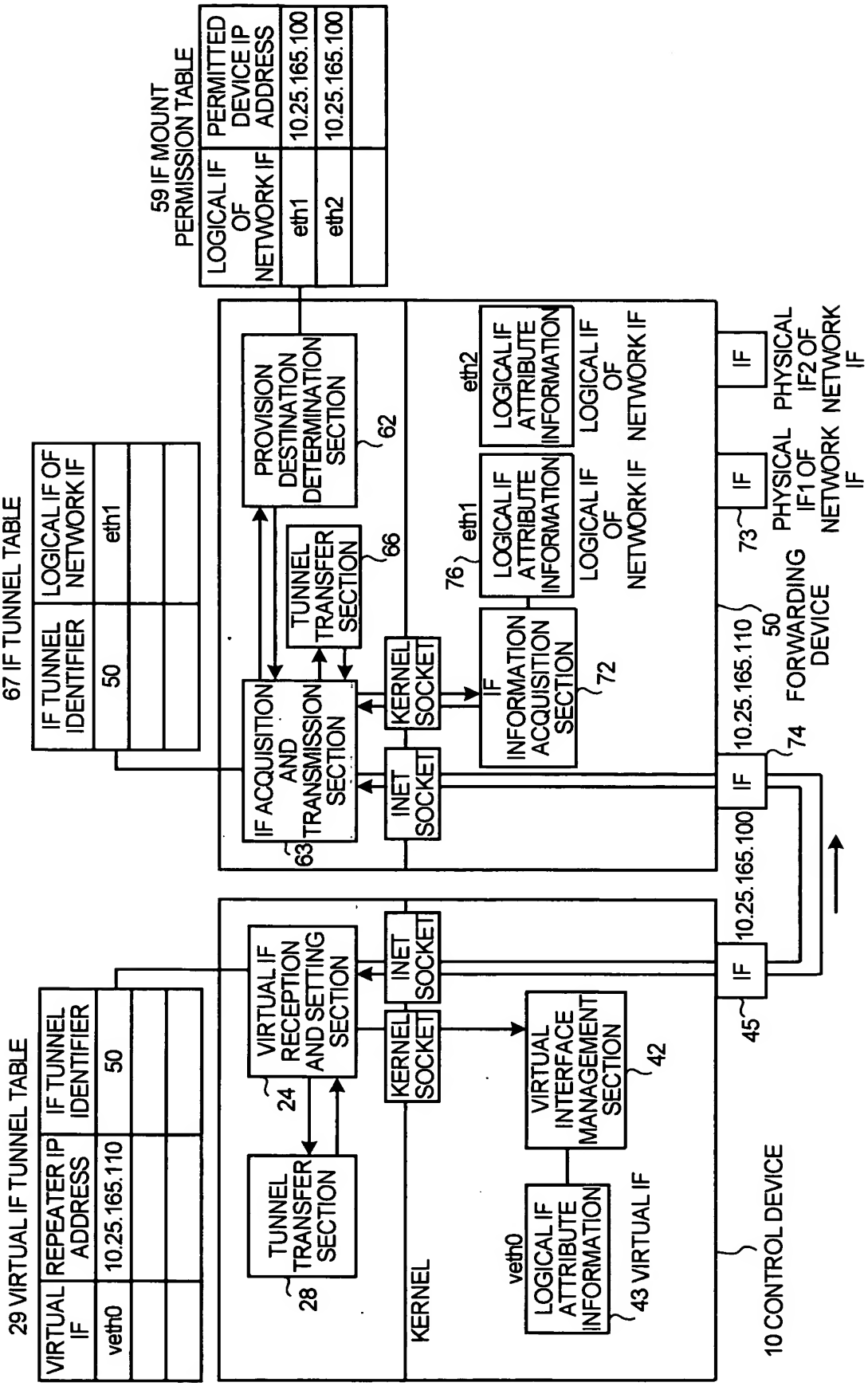

29 VIRTUAL IF TUNNEL TABLE
VIRTUAL IF
REPEATER IP ADDRESS
IF TUNNEL IDENTIFIER
veth0
10.25.165.110
50
67 IF TUNNEL TABLE
IF TUNNEL IDENTIFIER
LOGICAL IF OF NETWORK IF
50
eth1
59 IF MOUNT PERMISSION TABLE
LOGICAL IF OF NETWORK IF
PERMITTED DEVICE IP ADDRESS
eth1
10.25.165.100
eth2
10.25.165.100
10 CONTROL DEVICE
KERNEL
veth0
LOGICAL IF ATTRIBUTE INFORMATION
43 VIRTUAL IF
VIRTUAL INTERFACE MANAGEMENT SECTION
42
TUNNEL TRANSFER SECTION
28
VIRTUAL IF RECEPTION AND SETTING SECTION
24
KERNEL SOCKET
INET SOCKET
IF
45
10.25.165.100
IF ACQUISITION AND TRANSMISSION SECTION
63
INET SOCKET
KERNEL SOCKET
TUNNEL TRANSFER SECTION
66
PROVISION DESTINATION DETERMINATION SECTION
62
IF INFORMATION ACQUISITION SECTION
72
76
eth1
LOGICAL IF ATTRIBUTE INFORMATION
LOGICAL IF OF NETWORK IF
eth2
LOGICAL IF ATTRIBUTE INFORMATION
LOGICAL IF OF NETWORK IF
IF
10.25.165.110
74
50 FORWARDING DEVICE
IF
73
PHYSICAL IF1 OF NETWORK IF
IF
PHYSICAL IF2 OF NETWORK IF

FIG.27

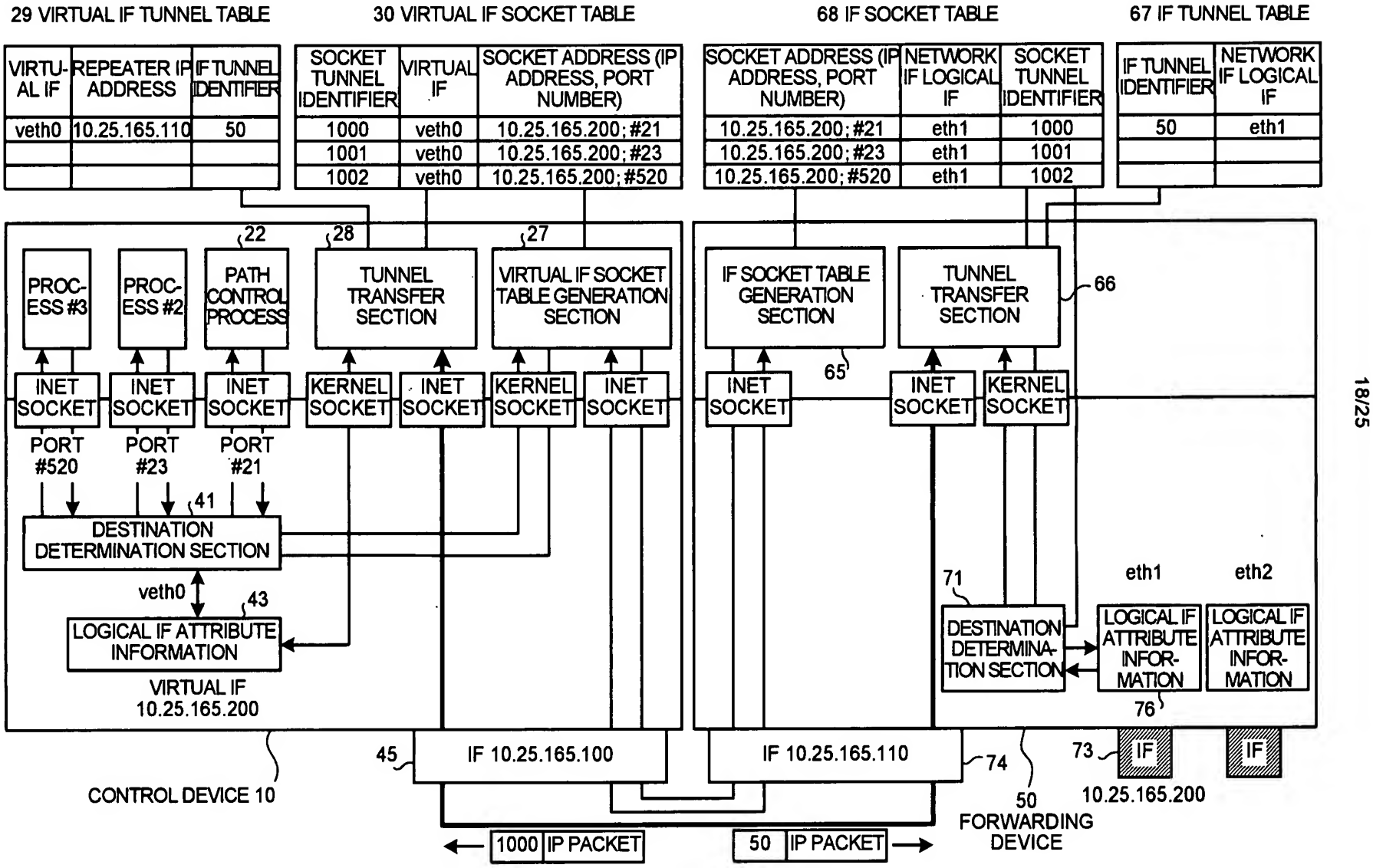

29 VIRTUAL IF TUNNEL TABLE
VIRTU-AL IF
REPEATER IP ADDRESS
IF TUNNEL IDENTIFIER
veth0
10.25.165.110
50
30 VIRTUAL IF SOCKET TABLE
SOCKET TUNNEL IDENTIFIER
VIRTUAL IF
SOCKET ADDRESS (IP ADDRESS, PORT NUMBER)
1000
veth0
10.25.165.200;#21
1001
veth0
10.25.165.200;#23
1002
veth0
10.25.165.200;#520
68 IF SOCKET TABLE
SOCKET ADDRESS (IP ADDRESS, PORT NUMBER)
NETWORK IF LOGICAL IF
SOCKET TUNNEL IDENTIFIER
10.25.165.200;#21
eth1
1000
10.25.165.200;#23
eth1
1001
10.25.165.200;#520
eth1
1002
67 IF TUNNEL TABLE
IF TUNNEL IDENTIFIER
NETWORK IF LOGICAL IF
50
eth1
22
28
27
PROC-ESS #3
PROC-ESS #2
PATH CONTROL PROCESS
TUNNEL TRANSFER SECTION
VIRTUAL IF SOCKET TABLE GENERATION SECTION
IF SOCKET TABLE GENERATION SECTION
TUNNEL TRANSFER SECTION
66
65
INET SOCKET
KERNEL SOCKET
PORT #520
PORT #23
PORT #21
41
DESTINATION DETERMINATION SECTION
veth0
43
LOGICAL IF ATTRIBUTE INFORMATION
VIRTUAL IF 10.25.165.200
71
eth1
eth2
DESTINATION DETERMINA-TION SECTION
LOGICAL IF ATTRIBUTE INFOR-MATION
76
45
IF 10.25.165.100
IF 10.25.165.110
74
73
IF
10.25.165.200
CONTROL DEVICE 10
50
FORWARDING DEVICE
1000 IP PACKET
50 IP PACKET

FIG.28

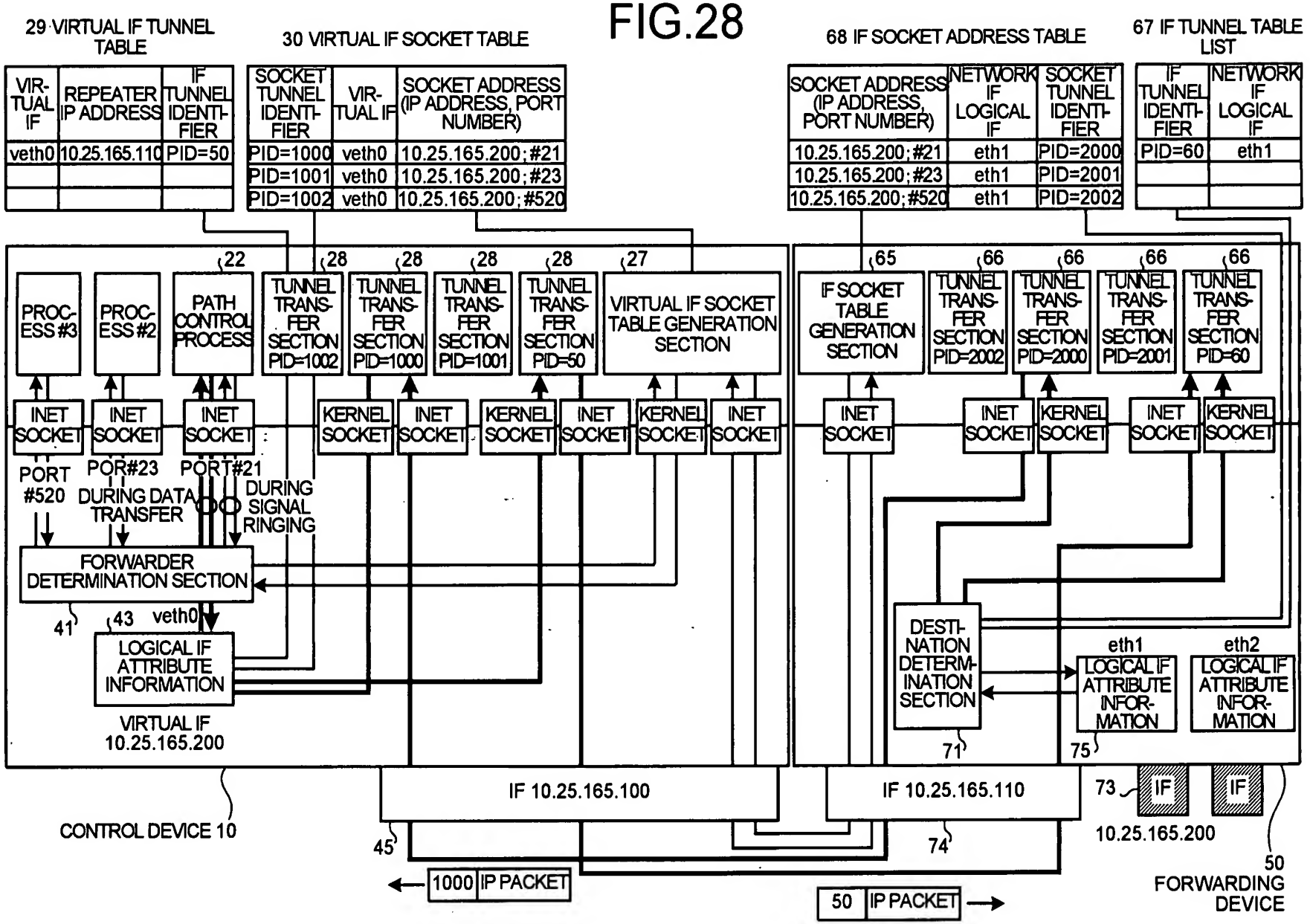

29 VIRTUAL IF TUNNEL TABLE
VIR-TUAL IF
REPEATER IP ADDRESS
IF TUNNEL IDENTI-FIER
veth0
10.25.165.110
PID=50
30 VIRTUAL IF SOCKET TABLE
SOCKET TUNNEL IDENTI-FIER
VIR-TUAL IF
SOCKET ADDRESS (IP ADDRESS, PORT NUMBER)
PID=1000
veth0
10.25.165.200;#21
PID=1001
veth0
10.25.165.200;#23
PID=1002
veth0
10.25.165.200;#520
68 IF SOCKET ADDRESS TABLE
SOCKET ADDRESS (IP ADDRESS, PORT NUMBER)
NETWORK IF LOGICAL IF
SOCKET TUNNEL IDENTI-FIER
10.25.165.200;#21
eth1
PID=2000
10.25.165.200;#23
eth1
PID=2001
10.25.165.200;#520
eth1
PID=2002
67 IF TUNNEL TABLE LIST
IF TUNNEL IDENTI-FIER
NETWORK IF LOGICAL IF
PID=60
eth1
22
28
28
28
28
27
65
66
66
66
66
PROC-ESS #3
PROC-ESS #2
PATH CONTROL PROCESS
TUNNEL TRANS-FER SECTION PID=1002
TUNNEL TRANS-FER SECTION PID=1000
TUNNEL TRANS-FER SECTION PID=1001
TUNNEL TRANS-FER SECTION PID=50
VIRTUAL IF SOCKET TABLE GENERATION SECTION
IF SOCKET TABLE GENERATION SECTION
TUNNEL TRANS-FER SECTION PID=2002
TUNNEL TRANS-FER SECTION PID=2000
TUNNEL TRANS-FER SECTION PID=2001
TUNNEL TRANS-FER SECTION PID=60
INET SOCKET
KERNEL SOCKET
PORT #520
PORT#23 DURING DATA TRANSFER
PORT#21 DURING SIGNAL RINGING
FORWARDER DETERMINATION SECTION
41
43
veth0
LOGICAL IF ATTRIBUTE INFORMATION
VIRTUAL IF 10.25.165.200
DESTI-NATION DETERM-INATION SECTION
71
eth1
eth2
LOGICAL IF ATTRIBUTE INFOR-MATION
75
IF 10.25.165.100
IF 10.25.165.110
73
IF
10.25.165.200
CONTROL DEVICE 10
45
74
50
FORWARDING DEVICE
1000
IP PACKET
50
IP PACKET

FIG.29

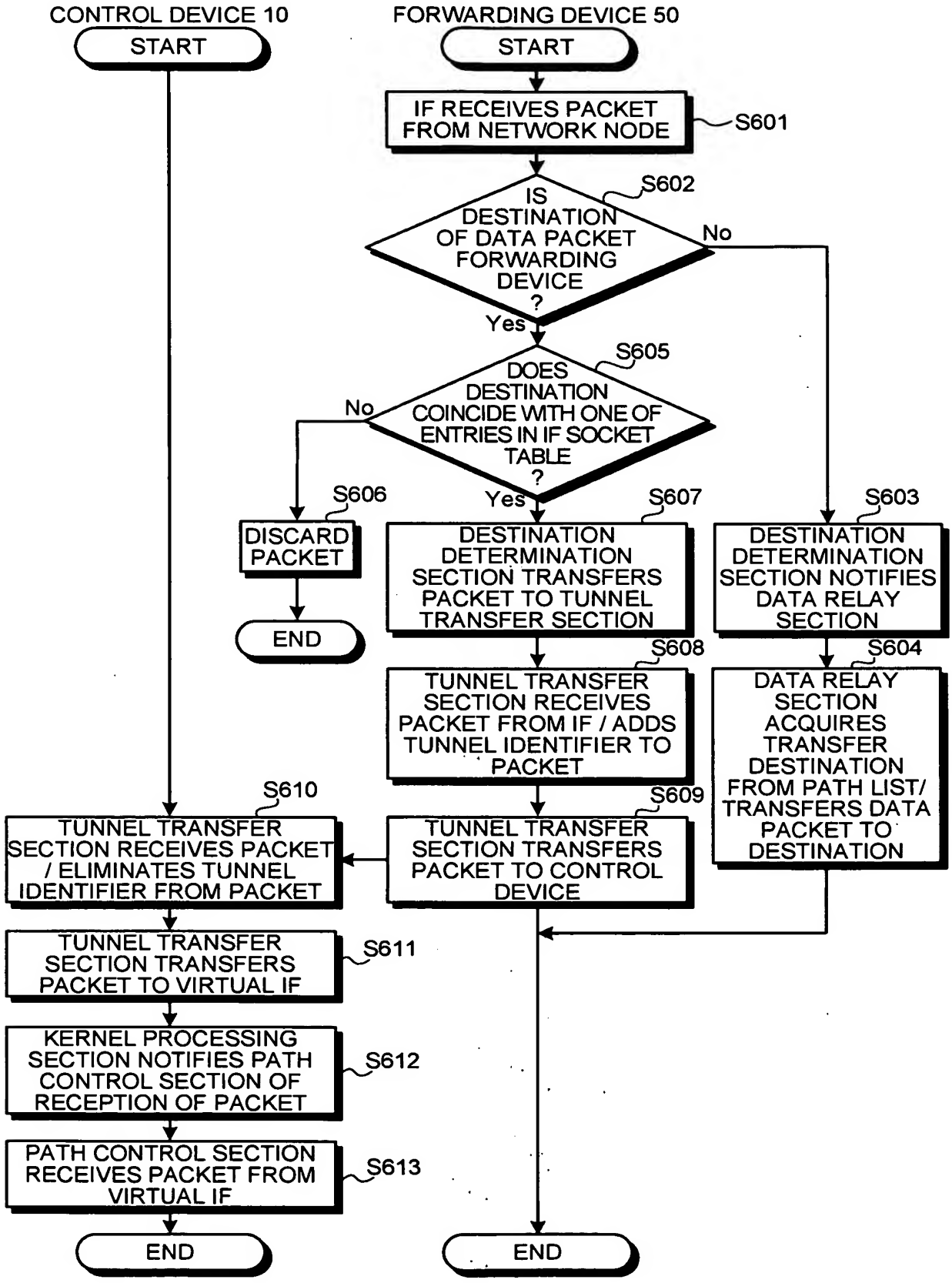

CONTROL DEVICE 10
START
FORWARDING DEVICE 50
START
IF RECEIVES PACKET FROM NETWORK NODE
S601
IS DESTINATION OF DATA PACKET FORWARDING DEVICE ?
S602
No
Yes
DOES DESTINATION COINCIDE WITH ONE OF ENTRIES IN IF SOCKET TABLE ?
S605
No
Yes
S606
DISCARD PACKET
END
S607
DESTINATION DETERMINATION SECTION TRANSFERS PACKET TO TUNNEL TRANSFER SECTION
S603
DESTINATION DETERMINATION SECTION NOTIFIES DATA RELAY SECTION
S608
TUNNEL TRANSFER SECTION RECEIVES PACKET FROM IF / ADDS TUNNEL IDENTIFIER TO PACKET
S604
DATA RELAY SECTION ACQUIRES TRANSFER DESTINATION FROM PATH LIST/ TRANSFERS DATA PACKET TO DESTINATION
S610
TUNNEL TRANSFER SECTION RECEIVES PACKET / ELIMINATES TUNNEL IDENTIFIER FROM PACKET
S609
TUNNEL TRANSFER SECTION TRANSFERS PACKET TO CONTROL DEVICE
TUNNEL TRANSFER SECTION TRANSFERS PACKET TO VIRTUAL IF
S611
KERNEL PROCESSING SECTION NOTIFIES PATH CONTROL SECTION OF RECEPTION OF PACKET
S612
PATH CONTROL SECTION RECEIVES PACKET FROM VIRTUAL IF
S613
END
END

FIG.30

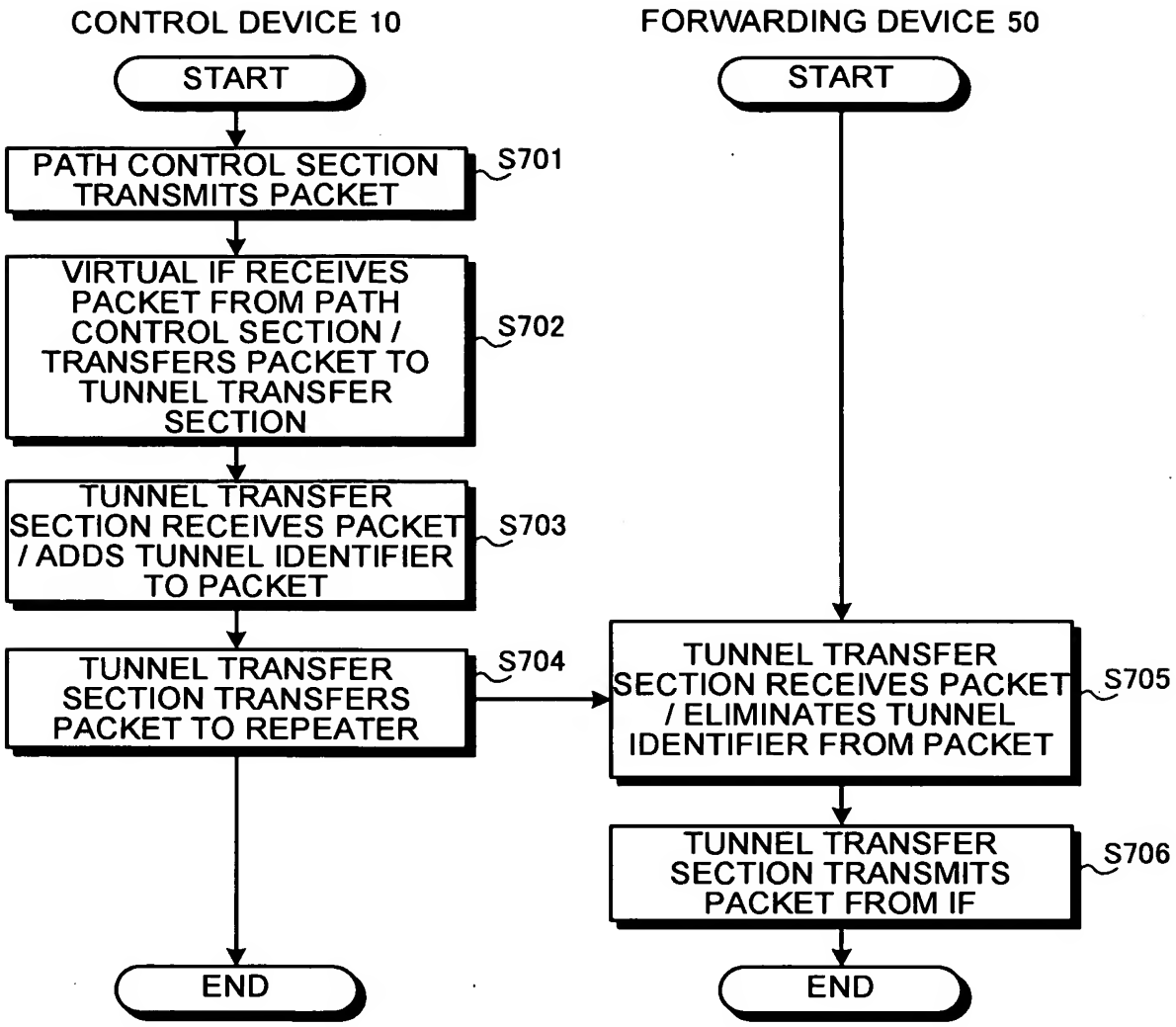

CONTROL DEVICE 10
START
PATH CONTROL SECTION TRANSMITS PACKET
S701
VIRTUAL IF RECEIVES PACKET FROM PATH CONTROL SECTION / TRANSFERS PACKET TO TUNNEL TRANSFER SECTION
S702
TUNNEL TRANSFER SECTION RECEIVES PACKET / ADDS TUNNEL IDENTIFIER TO PACKET
S703
TUNNEL TRANSFER SECTION TRANSFERS PACKET TO REPEATER
S704
END
FORWARDING DEVICE 50
START
TUNNEL TRANSFER SECTION RECEIVES PACKET / ELIMINATES TUNNEL IDENTIFIER FROM PACKET
S705
TUNNEL TRANSFER SECTION TRANSMITS PACKET FROM IF
S706
END

FIG.31

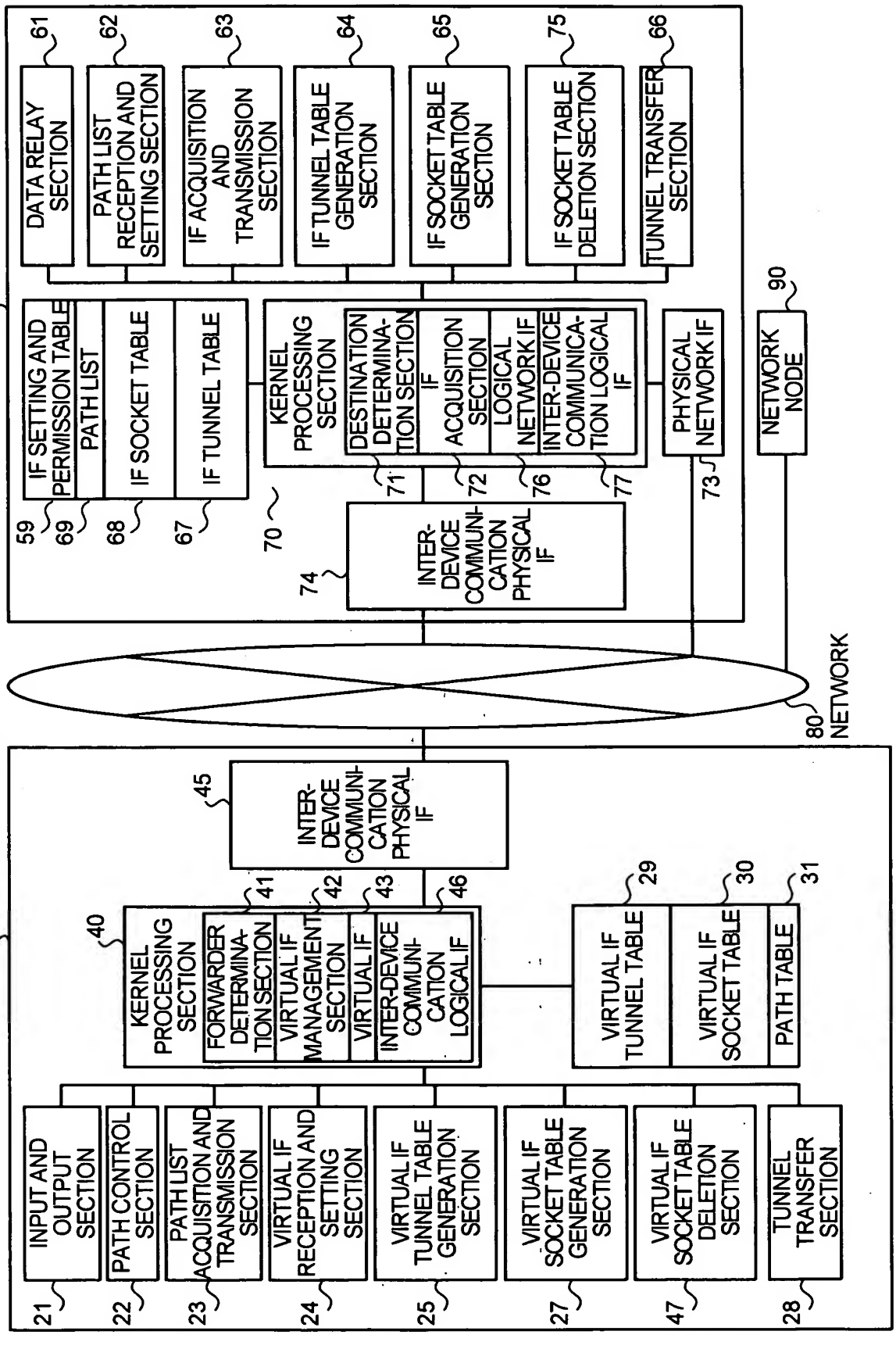

10 CONTROL DEVICE
50 FORWARDING DEVICE
80 NETWORK
INPUT AND OUTPUT SECTION
PATH CONTROL SECTION
PATH LIST ACQUISITION AND TRANSMISSION SECTION
VIRTUAL IF RECEPTION AND SETTING SECTION
VIRTUAL IF TUNNEL TABLE GENERATION SECTION
VIRTUAL IF SOCKET TABLE GENERATION SECTION
VIRTUAL IF SOCKET TABLE DELETION SECTION
TUNNEL TRANSFER SECTION
KERNEL PROCESSING SECTION
FORWARDER DETERMINATION SECTION
VIRTUAL IF MANAGEMENT SECTION
VIRTUAL IF
INTER-DEVICE COMMUNICATION LOGICAL IF
INTER-DEVICE COMMUNICATION PHYSICAL IF
VIRTUAL IF TUNNEL TABLE
VIRTUAL IF SOCKET TABLE
PATH TABLE
DATA RELAY SECTION
PATH LIST RECEPTION AND SETTING SECTION
IF ACQUISITION AND TRANSMISSION SECTION
IF TUNNEL TABLE GENERATION SECTION
IF SOCKET TABLE GENERATION SECTION
IF SOCKET TABLE DELETION SECTION
TUNNEL TRANSFER SECTION
IF SETTING AND PERMISSION TABLE
PATH LIST
IF SOCKET TABLE
IF TUNNEL TABLE
KERNEL PROCESSING SECTION
DESTINATION DETERMINATION SECTION
IF ACQUISITION SECTION
LOGICAL NETWORK IF
INTER-DEVICE COMMUNICATION LOGICAL IF
INTER-DEVICE COMMUNICATION PHYSICAL IF
PHYSICAL NETWORK IF
NETWORK NODE

FIG.32

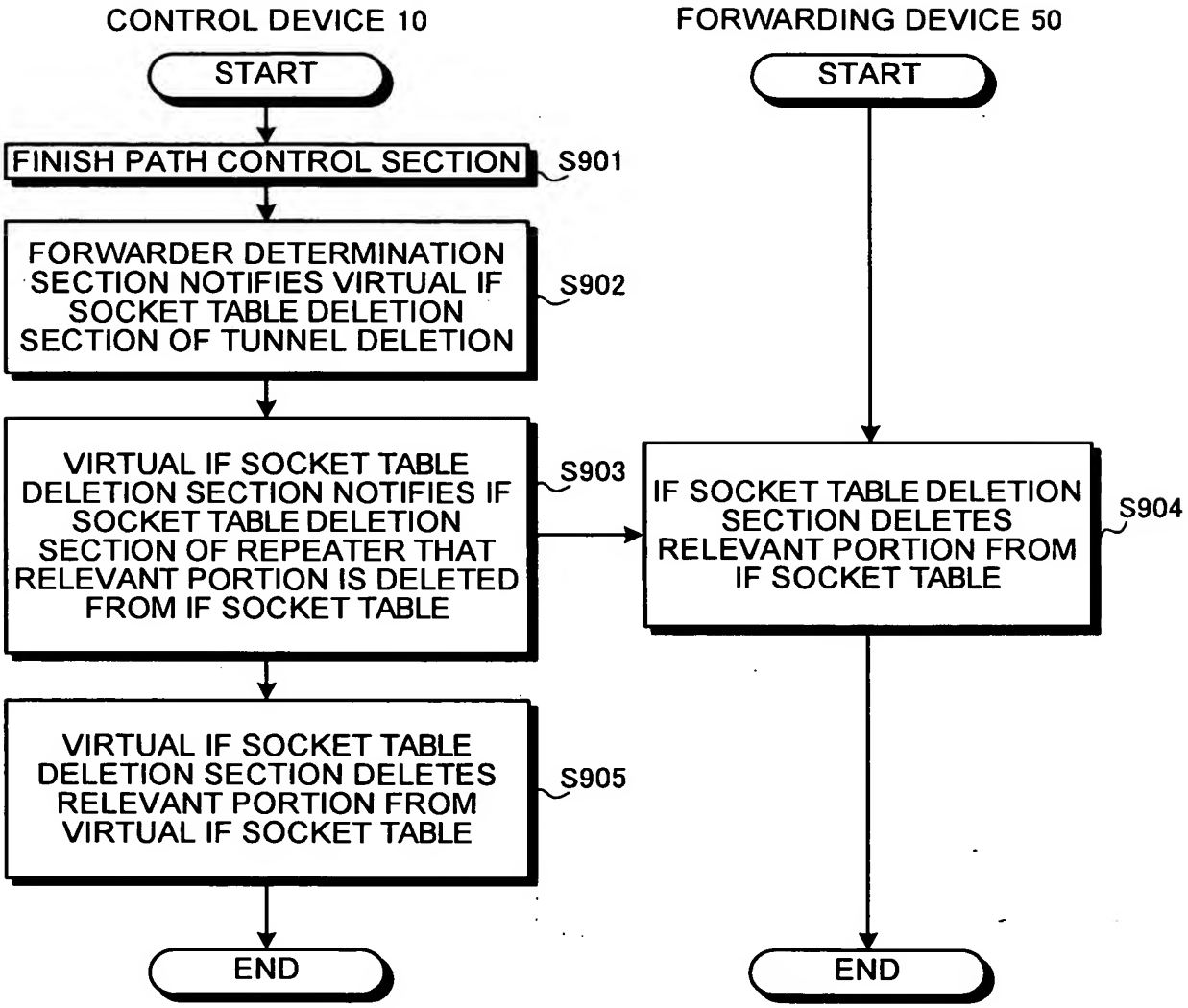

CONTROL DEVICE 10
FORWARDING DEVICE 50
START
START
FINISH PATH CONTROL SECTION
S901
FORWARDER DETERMINATION SECTION NOTIFIES VIRTUAL IF SOCKET TABLE DELETION SECTION OF TUNNEL DELETION
S902
VIRTUAL IF SOCKET TABLE DELETION SECTION NOTIFIES IF SOCKET TABLE DELETION SECTION OF REPEATER THAT RELEVANT PORTION IS DELETED FROM IF SOCKET TABLE
S903
IF SOCKET TABLE DELETION SECTION DELETES RELEVANT PORTION FROM IF SOCKET TABLE
S904
VIRTUAL IF SOCKET TABLE DELETION SECTION DELETES RELEVANT PORTION FROM VIRTUAL IF SOCKET TABLE
S905
END
END

FIG.33

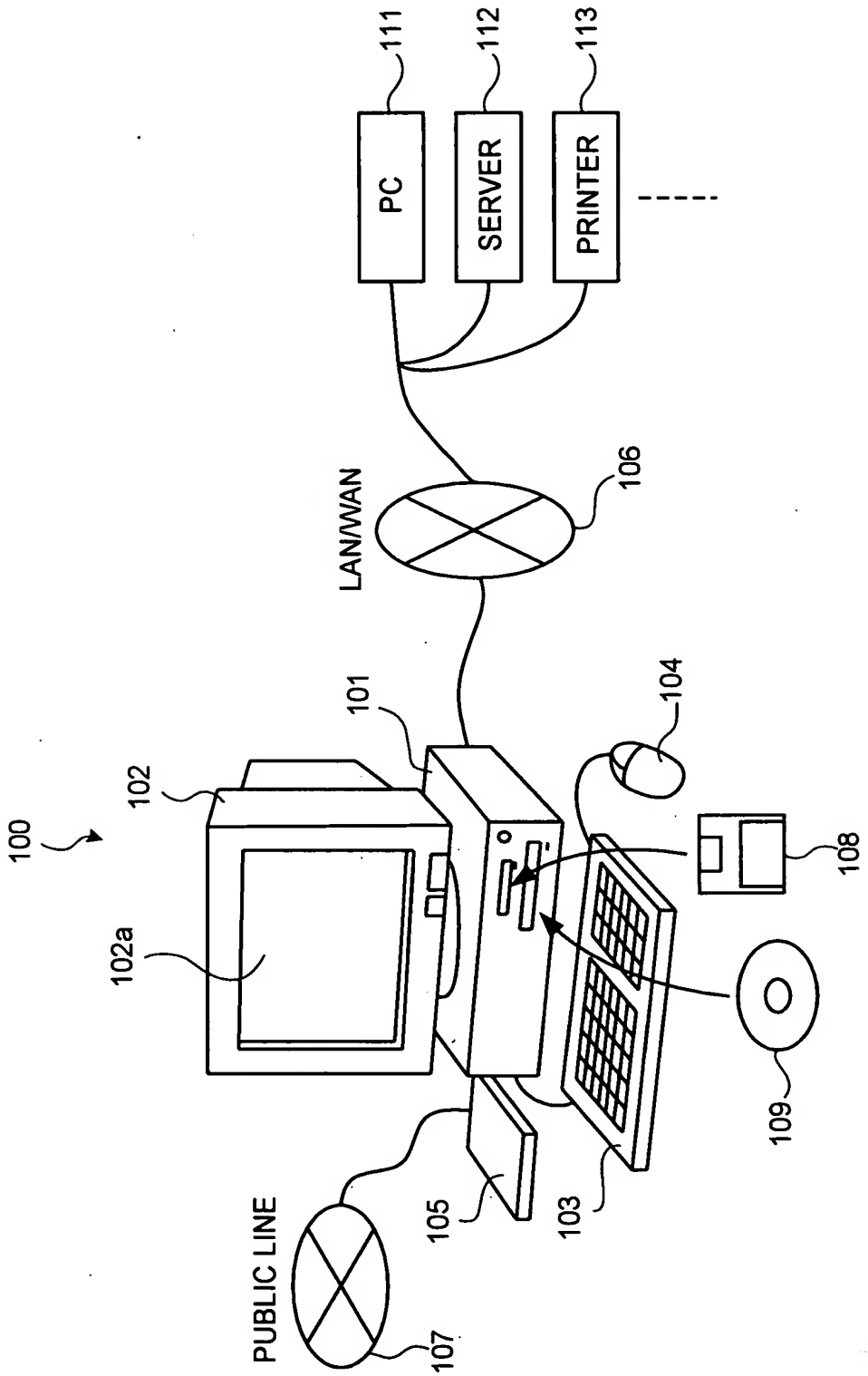
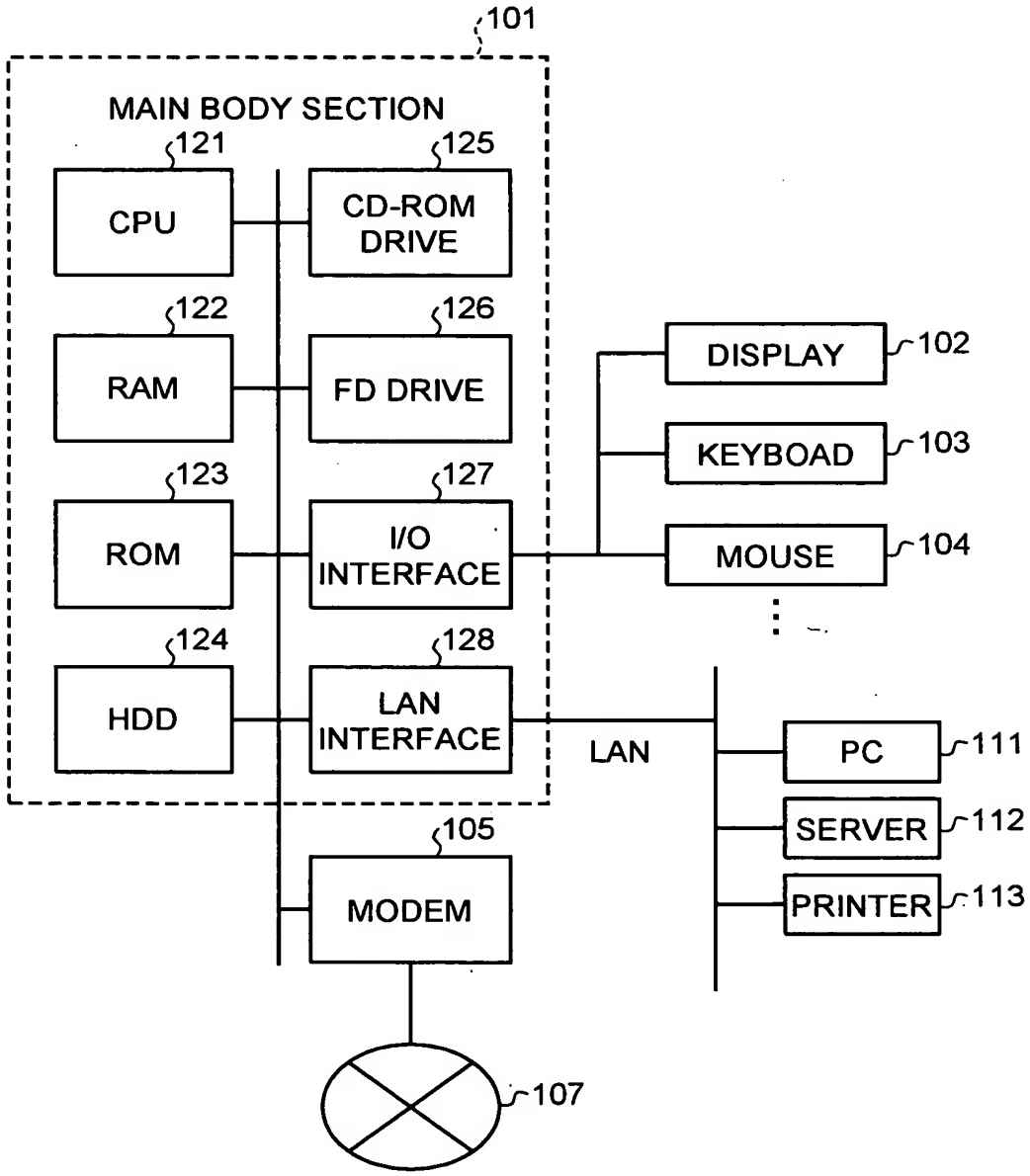

100
102
102a
101
104
108
109
103
105
107
PUBLIC LINE
LAN/WAN
106
PC
SERVER
PRINTER
111
112
113

FIG.34


101
MAIN BODY SECTION
121
CPU
125
CD-ROM DRIVE
122
RAM
126
FD DRIVE
123
ROM
127
I/O INTERFACE
124
HDD
128
LAN INTERFACE
105
MODEM
107
DISPLAY
102
KEYBOAD
103
MOUSE
104
LAN
PC
111
SERVER
112
PRINTER
113